

**EPA Superfund  
Record of Decision:**

**DEFENSE GENERAL SUPPLY CENTER (DLA)  
EPA ID: VA3971520751  
OU 05  
CHESTERFIELD COUNTY, VA  
03/25/1992**

Text:

RECORD OF DECISION

FOR

OU5 - ACID NEUTRALIZATION PITS SOURCE AREA

DEFENSE GENERAL SUPPLY CENTER

RICHMOND, VIRGINIA

PREPARED FOR

DEFENSE LOGISTICS AGENCY  
AND THE

U.S. ARMY CORPS OF ENGINEERS  
HUNTSVILLE DIVISION  
PREPARED BY:

LAW ENVIRONMENTAL

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1.0 DECLARATION

1.1 SITE NAME AND LOCATION

Acid Neutralization Pits (ANP) Source Area - Operable Unit 5

Defense General Supply Center (DGSC)

Chesterfield County, Virginia

1.2 STATEMENT OF BASIS AND PURPOSE

1.2.0.1 This decision document presents the selected interim remedial action for the Acid Neutralization Pits (ANP) Source Area - Operable Unit 5 (OU5) ("the ANP site") at the Defense General Supply Center (DGSC), in Richmond, Virginia, which was chosen in accordance with the Comprehensive Environmental Response Compensation, and Liability act (CERCLA) 42 U.S.C. 9601, et. seq., and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision is based on the administrative record for this site. This remedy was chosen by the Defense Logistics Agency (DLA) in consultation with the United States Environmental Protection Agency, Region III (EPA). Both the EPA and the Commonwealth of Virginia concur with the selected remedy.

1.3 ASSESSMENT OF THE SITE

1.3.0.1 Actual or threatened releases of hazardous substances at this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

1.4 DESCRIPTION OF THE SELECTED REMEDY

1.4.0.1 This operable unit is the fifth of eight operable units that are currently planned for the site. Operable Unit 5 addresses the soils impacted by the Acid Neutralization Pits (ANP). The other operable units, and the portions of the site that they address are as follows:

- . OU1 - Open Storage Area (OSA) Source Area
- . OU2 - Area 50 Source Area

- . OU3 - National Guard Area Source Area
- . OU4 - Fire Training Source Area
- . OU6 - Area 50/Open Storage Area/National Guard Area Ground Water
- . OU7 - Fire Training Area Ground Water
- û OU8 - Acid Neutralization Pits Ground Water

1.4.0.2 This action addresses the contaminated soils at the ANP site by treating the soils in place utilizing vacuum extraction. After treatment is complete, no further remediation for soils at the ANP site will be necessary. Operable Unit 8 will address the remediation of ground water at the ANP site.

1.4.0.3 The major components of the selected remedy include:

- . Installation of a vapor extraction system, including extraction and vent wells, a manifold system, a utility building, and a vapor containment system;
- . Construction of covers over the pits to prevent their further use and the infiltration of rainwater;
- . Continued operation and maintenance of the vapor extraction system for approximately four (4) years until tests indicate the contaminants are no longer present at levels that threaten ground water; and
- . Analytical sampling of the affected media (soil) at the end of the clean-up period to evaluate the effectiveness of contaminant removal.

## 1.5 STATUTORY DETERMINATIONS

1.5.0.1 The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is costeffective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element. Because this remedy will not result in hazardous substances remaining on-site above health-based levels, the five-year review will not apply to this action.

## 2.0 DECISION SUMMARY

### 2.1 SITE NAME, LOCATION AND DESCRIPTION

Acid Neutralization Pits (ANP) Source Area - Operable Unit 5  
 Defense General Supply Center (DGSC)  
 Chesterfield County, Virginia

2.1.0.1 The DGSC is located in Chesterfield County, Virginia, approximately 11 miles south of the city of Richmond, Virginia. The ANP area is located

in the northern section of DGSC at the end of warehouse 65 (Figure 2-1). This area is the site of two former concrete settling tanks which received wastewater from metal cleaning operations conducted at warehouse 65. The two tanks were located in a fenced area approximately twenty-five (25) feet northwest of the warehouse. The primary pit had a capacity of 14,600 gallons; the secondary pit had a capacity of 3,000 gallons. The primary and secondary pits were each approximately 6.5 feet in depth. Both pits, and their location relative to warehouse 65, are shown in Figure 2-2.

2.1.0.2 The facility was originally constructed in 1941 as two separate facilities: the Richmond General Depot and Richmond Holding and Reconsignment Point. In 1962 the installation became known as the DGSC.

2.1.0.3 The Defense Logistics Agency (DLA), an agency of the Department of Defense (DOD), provides logistics support to the military services including procurement and supply support, contract administration and other services. Since 1942, DGSC's mission has been the managing and furnishing of military general supplies to the Armed Forces and several Federal Civilian Agencies. Today DGSC manages more than 300,000 general supply items at a facility encompassing 640 acres. DGSC has more than 16 million square feet of covered storage space in 27 large brick warehouses and a million square feet of office space.

2.1.0.4 Land use in Chesterfield County in the vicinity of DGSC is primarily single family residential, intermixed with retail stores and light industry. The DGSC is the major industry in the area. The area to the northeast and east of DGSC has been developed as both single family and multi-family housing. Bensley Village, a major subdivision of Richmond, is located northeast of the ANP site in the area considered to be downgradient of the upper aquifer flow at DGSC. There are approximately 600 houses, 60 multi-family apartment buildings, and 30 mobile homes located downgradient and within one mile of the ANP area. The on-base population at DGSC includes 119 permanent resident and 3,682 employees. The estimated number of people living within one mile downgradient of the ANP area is 4,100. The total population living within a one mile radius of the site is estimated to be 14,400.

2.1.0.5 The DGSC is located within the modified continental climatic zone, an area characterized by extreme variations in temperature and precipitation during the course of a year. Typically, the area experiences warm summers, relatively mild winters and normally adequate rainfall. The mean annual pan evaporation rate for the area is between 48 and 64 inches. Precipitation and pan evaporation are generally greatest during July and August. Wind direction in the vicinity of DGSC is variable most of the time although the prevailing wind direction is southerly.

2.1.0.6 The land surface at DGSC has been extensively altered by grading and filling operations. Generally, the topography is essentially flat with a slight slope towards the northeast. The maximum difference in the local topographic relief is approximately 30 feet. Elevations range from 135 feet above mean sea level (msl) at the southwest corner of the facility to 108 feet above msl near the northeastern portion. Surface drainage in the ANP area is generally to the southwest towards a storm sewer system that drains south and to the east and discharges to an unnamed creek along the eastern

boundary of the facility.

2.1.0.7 The unconsolidated soils below the DGSC have been divided into four formations by the U.S. Geological Survey. The Eastover Formation is present immediately below the land surface and consists of up to 25 feet of interlayered beds of sand, silt, and clay with occasional gravel. The predominantly gray clay and silt of the Calvert Formation underlies the Eastover throughout the area. The Calvert Formation is typically 11 feet thick. The Aquia Formation, approximately 7 feet of gray sand, gravel and clay, underlies the Calvert Formation. The Potomac Formation, which underlies the Aquia Formation, extends to the bedrock. The Potomac consists of approximately 40 feet of interbedded sand and gravel with occasional silty and clayey seams. Bedrock in the region consists of the Petersburg Granite.

2.1.0.8 Soils and geologic conditions at the ANP site were characterized during the Remedial Investigation (RI) at the site. An unconfined, water table aquifer is present within the Eastover Formation. This aquifer, referred to in this document as the Upper Aquifer, would be the first water bearing unit to be impacted by any contamination originating from the ANPs. Vertical migration of contaminants from the Upper Aquifer would be inhibited by the underlying Calvert and Aquia Formations. These two formations, which have lower permeabilities than the overlying and underlying formations, are referred to as the Confining Unit.

2.1.0.9 Ground-water flow in the Upper Aquifer is generally northeast. The average depth to ground water varies with season but typically ranges from 13 to 16 feet below ground surface. The hydraulic gradient has been calculated to range from 0.05 percent to 0.12 percent. The low hydraulic gradient in the ground water indicates that the potentiometric surface and groundwater flow direction are susceptible to seasonal changes in recharge, discharge or precipitation.

## 2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.2.0.1 The ANPs received wastewater from metal cleaning operations conducted at warehouse 65. The metal cleaning operations in warehouse 65 included cleaning (paint and rust removal) and repainting steel combat helmets and compressed gas cylinders. These activities were in operation from 1958 to the early 1980's. The metal cleaning system consisted of a boiling caustic bath of sodium hydroxide (NaOH) to remove the paint, followed by a hot water rinse dip to remove residual caustic solution and paint residues. The items were then immersed in a twenty percent hydrochloric acid (HCl) solution to remove rust and treated with a neutralization solution consisting of sodium hydroxide, surfactant and sodium bicarbonate.

2.2.0.2 The spent cleaning solutions were discharged to the settling pits every one to two months. The intervals varied depending on frequency and duration of use. In the settling pits, the solids separated and collected in the bottom of the pits as sludge. The Ph of the wastewater was adjusted by manual addition of lime prior to its discharge. From 1958 to the late 1970's wastewater was discharged from the primary pit to the storm sewer. With the addition of the secondary pit in the late 1970's, wastewater

discharge was connected to the sanitary sewer.

2.2.0.3 While the pits were in operation, sludges were periodically removed and disposed of at the Chesterfield County Landfill. The U.S. Army Environmental Hygiene Agency analyzed leachate from the sludge in 1979 using the Toxic Extraction Procedure (EP Tox) method. Based on the analysis of the EP Tox results, the sludges were not characterized as hazardous waste. The pits were closed in 1985. The remaining sludges were removed for off-site disposal, the bottoms of the pits were washed clean of residual sludges, and the pits were filled with clean soil. During the closure activities, the concrete sides and bottoms of the pits were observed to be broken and cracked. These cracks and holes may have served as migration routes for contaminants in the pits to the surrounding soils.

2.2.0.4 In 1984, the DGSC was recommended for placement on the CERCLA National Priority List (NPL), and was promulgated to the NPL in 1987. This action was a result of a Hazard Ranking System (HRS) scoring performed for the DGSC that was based on the conclusions of previous studies done at the site by the United States Army Environmental Hygiene Agency (USAEHA). The DGSC received a hazardous ranking score of 33.35, with 28.5 being the minimum necessary to be promulgated to the NPL. In August 1986, the EPA issued a Corrective Action Permit to DGSC pursuant to the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901 et seq. As part of RCRA activities conducted at the site, Dames and Moore, a contractor of DGSC, submitted three Remedial Investigation Reports pertaining to sites investigated at DGSC in 1989. In September 1990, the DLA, DGSC, EPA, and the Commonwealth of Virginia entered into a CERCLA Interagency Agreement (IAG) pursuant to Section 120 of CERCLA, 42 U.S.C. 9620, which guides remediation activities.

## 2.3 SUMMARY OF COMMUNITY PARTICIPATION

2.3.0.1 On February 23, 1984, the DGSC organized an Interagency Task Force comprised of State regulatory agencies, U.S. Environmental Protection Agency (EPA), County agencies, Virginia National Guard, Rayon Park Representatives, and DGSC personnel. The purpose of this group was to ensure that actions carried out at the site were done with input and review from the affected parties. This group was active in the mid 1980s, but became less active after county water supply lines were installed to service residents located near the DGSC east boundary.

2.3.0.2 The proposed plan for Operable Unit 5 - Acid Neutralization Pits was released to the public on January 20, 1992. This document was made available to the public in the administrative record maintained at the Chesterfield Public Library at the Chesterfield County Courthouse in Chesterfield, Virginia. The notice of availability for this document was published in the Richmond Time Dispatch on January 20, 1992. The public comment period was held from January 20 through March 6, 1992. In addition, a public meeting was held on February 20, 1992. At this meeting, representatives from the DLA, EPA, and Commonwealth of Virginia answered questions concerning the remedial alternatives evaluated for this site. A response to the comments received during this period is included in the Responsiveness Summary, which is part of this Record of Decision. This decision document presents the selected interim remedial action for Operable

Unit Five (OU5) - Acid Neutralization Pits source area at the DGSC in Chesterfield County, Virginia, chosen in accordance with CERCLA, as amended by SARA and, to the extent practical, the National Contingency Plan.

## 2.4 SCOPE AND ROLE OF OPERABLE UNIT

2.4.0.1 As with many Superfund sites, the problems at DGSC are complex. As a result, the work at the site has been organized into eight operable units. These are:

OU One: Open Storage Area Source Area  
OU Two: Area 50 Source Area  
OU Three: National Guard Area Source Area  
OU Four: Fire Training Source Area  
OU Five: Acid Neutralization Pits Source Area  
OU Six: Area 50/Open Storage Area/National Guard Area Ground Water  
OU Seven: Fire Training Area Ground Water  
OU Eight: Acid Neutralization Pits Ground Water

2.4.0.2 The scope of this action addresses the fifth operable unit (OU5) at the site, the Acid Neutralization Pits (ANP) source area. There are no principal threats for OU5. The purpose of this interim response action is to remove contaminants of concern from the soils to prevent current or future leaching of contaminants from the soils into the ground water. Ground water at the site is addressed as part of a separate Operable Unit (OU8).

## 2.5 SUMMARY OF SITE CHARACTERISTICS

2.5.0.1 Several sampling and analysis programs have been performed at the ANP area in order to evaluate the magnitude and extent of contamination. The locations of the soil and ground-water samples were selected to identify sources of contaminants, potential pathways of contaminant migration as well as the magnitude and extent of contamination. A total of six soil samples and 15 ground-water samples were collected for chemical analysis during the period from November 1986 to November 1988. Figure 2-3 shows sample locations at the ANP area. In addition, additional sampling will be conducted in the ANP area in conjunction with OU8, Acid Neutralization Pits Ground Water.

2.5.0.2 The results of the chemical analysis on the soil samples are presented in Table 2-1. The soil samples were analyzed for the full Target Compound List (TCL) and Target Analyte List (TAL) constituents. The complete analytical results are presented in the Draft Remedial Investigation Report, Acid Neutralization Pit Area - Dames & Moore, Bethesda, MD (4/27/89).

2.5.0.3 Samples from the soil borings in the pits had the greatest number of constituents present. The constituents detected were primarily low levels of volatile organics and semi-volatiles including phthalates, naphthalene and phenanthrene. In addition, one soil sample taken from a depth of fifteen feet had arsenic present at a concentration higher than the local background levels.

2.5.0.4 The primary constituents of concern detected in the ground water samples were volatile organic compounds (VOCs). The predominant VOCs detected in the ground water were tetrachloroethylene and trichloroethylene (detected in 10 out of 14 samples). Other VOCs which were detected in more than one sample included acetone, methylene chloride, 1,2-dichloroethylene, and 1,2-dichloroethane. Table 2-2 provides a summary of constituents detected in the ground water at this site. Figure 2-3 shows the ground water plume in the Upper Aquifer using tetrachloroethylene as the marker constituent.

2.5.0.5 As there are no promulgated chemical-specific ARARs for constituents in soils, risk-based soil action levels were derived for the constituents of concern (tetrachloroethylene and trichloroethylene) at the ANP site. The risk-based levels were developed to be protective of workers at the facility, who may be exposed to contaminated

soils, via incidental ingestion, dermal contact and inhalation of fugitive dusts. The risk-based soil action levels are presented in Table 23. The only constituent detected in soils in excess of the risk-based soil action level was arsenic at a depth of 15 feet below the ground surface.

2.5.0.6 The soils are the apparent source of VOCs in the ground water at the ANP area. Low levels of VOCs, including tetrachloroethylene and trichloroethylene, were detected in the soil boring from the secondary settling tank at the site. Although VOCs were not known to have been used in the metal cleaning operations in warehouse 65, the ANPs were not covered during the time they were in operation and therefore could have been used for undocumented disposal of chemicals and solvents used in a variety of industrial operations at DGSC.

2.5.0.7 Risk-based soil action levels for protection of ground water were also calculated in the Focused Feasibility Report for OU5 - Acid Neutralization Pits Source Area, Law Environmental, Kennesaw, Georgia, November, 1991. The action levels are shown in Table 2-4. As may be seen, only tetrachloroethylene exceeded its risk-based soil action level.

## 2.6 SUMMARY OF SITE RISKS

2.6.0.1 A baseline risk assessment was conducted for the ANP area as documented in the Remedial Investigation Report for OU5 - Acid Neutralization Pits Area, Dames & Moore, Bethesda, Maryland, April 27, 1989. When this report was being prepared, the ANP Area had not been broken into two separate operable units (of eight total operable units now present at the site). The purpose of the baseline risk assessment was to evaluate the potential human health and environmental risks posed by soil and ground water contamination detected at the ANP area. The results of the baseline risk assessment as they pertain to the ANP Source Area (i.e., contaminated soils) are summarized briefly below.

2.6.0.2 The potential exposure pathways which were considered in the baseline risk assessment included the following:

- . Ingestion and dermal contact with ground water

- . Ingestion and dermal contact with contaminated soils
- . Inhalation of vapors and dusts
- . Ingestion and dermal contact with surface water
- . Ingestion of crops and other plants

2.6.0.3 Each of these pathways were evaluated for both on-site and off-site receptors, under both current and future conditions. A complete exposure pathway includes a source, release mechanism, environmental transport route, receptor, and exposure route. Of the forty-four (44) exposure pathways considered in the baseline risk assessment, only nine were considered to be complete.

2.6.0.4 There were no current exposure pathways considered to be complete at this site due to the depth at which contamination has been found (greater than 5 feet in depth). Therefore, direct contact with the soils is not possible unless they are disturbed by intrusive activities (i.e., excavation, drilling).

2.6.0.5 The potential future soil exposure pathways which were considered to be complete are summarized below:

- . Future inhalation of dust and dermal contact with soils during excavation activities by on-site workers
- . Future inhalation of dust, ingestion of soil and dermal contact with soils from excavation activities by off-site residents, due to dust from the excavation activities blowing offsite.

2.6.0.6 Excess lifetime cancer risks are determined by multiplying the intake level with the cancer potency factor. These risks are probabilities that are generally expressed in scientific notation (e.g.,  $1 \times 10^{-6}$  or  $1E6$ ). An excess lifetime cancer risk of  $1 \times 10^{-6}$  indicates that, as a plausible upper bound, an individual has a one in one million additional chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at a site.

2.6.0.7 The potential carcinogenic risks from future on-site exposure to soils were calculated to be  $2 \times 10^{-6}$ . This falls within the standard risk range EPA uses for evaluating carcinogenic risks which is  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$ . The elevated concentration of arsenic detected in one soil boring sample comprises 99 percent of the total estimated risk at the site. It should be noted that this sample was collected at a depth of approximately 15 feet. It is unlikely that on-site workers would be exposed to constituents at this depth during excavation activities.

2.6.0.8 Potential concern for non-carcinogenic effects of a single contaminant in a single medium is expressed as the hazard quotient (HQ) (or the ratio of the estimated intake derived from the contaminant concentration in a given medium to the contaminant's reference dose). By adding the HQs for all contaminants within a medium or across all media to which a given

population may reasonably be exposed, the Hazard Index (HI) can be generated. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

2.6.0.9 The potential non-carcinogenic hazard index from future on-site exposure to soils via the inhalation of fugitive dusts was calculated to be  $6 \times 10^{-13}$ . This value is far below the threshold value of 1.0 which represents a potentially unacceptable risk to human health from systemic toxicants.

2.6.0.10 If excavation activities were to take place at the ANP site, current carcinogenic and noncarcinogenic risks would be equal to those calculated for future activities assuming the same exposure pathways.

2.6.0.11 The potential risks involved from ground water at the site are addressed in a separate operable unit for ground water at the DGSC.

2.6.0.12 No critical habitats or endangered species were identified in the vicinity of the ANP site.

2.6.0.13 Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

## 2.7 DESCRIPTION OF ALTERNATIVES

2.7.0.1 CERCLA requires that each selected site remedy be protective of human health and the environment, comply with applicable or relevant and appropriate requirements (ARARs), utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable, and be cost effective.

2.7.0.2 During the Focused Feasibility studies (Focused Feasibility Report for OU5 - Acid Neutralization Pits Source Area, Law Environmental, Kennesaw, Georgia, 1991) for the ANP site, nine remedial action alternatives were initially identified. As a result of screening process, five out of nine remedial action alternatives were selected for detailed analysis. These five alternatives are described in the following paragraphs. For easy reference, the same alternative numbers as in the Feasibility Study Report are assigned to these alternatives. The five alternatives are as follows:

- . Alternative 1 (Surface Containment/Capping)
- . Alternative 4 (Excavation and Solid Phase Biotreatment)
- . Alternative 7 (Vacuum Vapor Extraction)
- . Alternative 5 (Institutional Controls)
- . Alternative 9 (No Action)

2.7.1 Alternative 1 (Surface Containment/Capping)

Estimated Capital Cost: \$ 33,165  
Estimated Annual O&M Cost: \$ 800  
Estimated Present Worth Cost: \$ 43,135  
Estimated Time to Implement: 1 to 3 months

2.7.1.1 The proposed design is for a multi-layer cap that includes an asphaltic concrete upper surface underlain by a layer of gravel with a bitumen-flooded non-woven geotextile fabric sandwiched between the asphalt layers. Cap surface area would be approximately 6,750 sq. ft. Construction of concrete or gravel lined perimeter drains should not be necessary since a storm drainage system exists and transects the site. Sloping of the cap towards the sides or towards the street to the east and using simple curbs to direct flow in that direction should be sufficient in handling storm water runoff. If this is determined not to be the case, one or more storm grates and collection/discharge structures could be installed and connected to the storm sewer line that transects the site. The site soils are generally of sufficient quality such that settlement under the cap should not be a problem.

#### 2.7.2 Alternative 4 (Excavation and Solid Phase Biotreatment)

Estimated Capital Cost: \$ 194,208  
Estimated Annual O&M Cost: \$ 0  
Estimated Present Worth Cost: \$ 194,208  
Estimated Time to Implement: 3 to 6 months

2.7.2.1 The use of excavation and ex-situ solid phase biotreatment has been found to be very effective in reducing the mass of most organic contaminants in contaminated soils.

2.7.2.2 Site Preparation/Mobilization: Surface preparation prior to excavation should be limited to obstacle removal. The site will need to be segregated into zones and staging areas prior to mobilization or construction of the treatment equipment. Site zones will include the exclusion zone, support zone, and decontamination zone as well as a staging area for temporary storage of excavated soil prior to treatment. Another staging area will be required for temporary storage of treated soil for curing prior to replacement. The general work area including all zones and staging areas will be fenced to delineate boundaries and prevent uncontrolled access.

2.7.2.3 Equipment Testing: Testing of equipment will be necessary at the site, just after the treatment units have been erected and prior to full implementation of remedial activity, to provide for air emissions permitting requirements and to verify on-site performance of the equipment.

2.7.2.4 Excavation: Excavation will be accomplished using either a front-end loader or a backhoe. Either a sloped or shored excavation could be used based on safety and adjacent structures considerations. Vertical excavation utilizing soldier-pile and lagging construction would minimize the amount of spoil generated which would potentially require treatment along with the contaminated soil. For this reason, vertical-walled excavation was found to be approximately 16% less expensive to implement than traditional sloped-walled excavation. The excavation would be coordinated with removal of the

pits themselves. It is assumed that the concrete from the tanks is contaminated and will be demolished, crushed and treated along with the contaminated soil. Reinforcing steel would be scrapped and decontaminated.

2.7.2.5 Treatment: Particle size separation may be necessary to screen out large particles from the soil prior to feeding into the treatment unit. Treatment generally consists of mixing the contaminated soil with a mixture of nutrients and surfactants. Water may also be added to increase the soil moisture content. After mixing, the soil is stored in small piles open to air on lined staging areas where it is allowed to cure. During curing, the indigenous soil microbes metabolize the organics present, aided by the surfactant/nutrient mixture, and aeration induced by mixing.

2.7.2.6 Additional Testing: Excavation of the pits themselves would allow further examination and testing of the underlying soils. Depending on the exact location and extent of cracks in the concrete, soil contamination may be localized to certain areas under the tank. Additional testing would allow a more complete evaluation of the extent of contamination than is currently available. The testing would allow a focusing of the excavation effort and a better evaluation of contaminated soil quantities. Air monitoring would be necessary at the ANP Area if the contaminant quantity is found to be much higher than presently estimated.

2.7.2.7 Closure: After the soil has been treated and re-emplaced into the excavation, no special security or site restrictions will need to be constructed or enforced.

### 2.7.3 Alternative 7 (Vacuum Vapor Extraction)

Estimated Capital Cost: \$ 58,872  
Estimated Annual O&M Cost: \$ 16,000  
Estimated Present Worth Cost: \$ 115,607  
Estimated Time to Implement: 3 to 6 months  
Estimated Years to Remediate: 4 years

2.7.3.1 Vacuum extraction of soil gas has been shown to be effective at reducing the mass of volatile organic constituents in soils. Various system configurations are potentially applicable. However, the vertical extraction system described is considered appropriate for this site (Figure 24 & 2-5).

2.7.3.2 Site Preparation/Mobilization: Surface preparation prior to well installation is not necessary. A small drill rig will be mobilized for well and vent installation.

2.7.3.3 Well Installation: Six extraction wells and two venting wells have been assumed for development of a cost estimate. A significant consideration in the design and installation of the vacuum wells is the proper seal to eliminate "short circuiting" of air directly down the well bore. The actual number of both extraction wells and venting wells may be different in actual application.

2.7.3.4 Blower Installation: One blower capable of maintaining an appropriate vacuum (estimated at approximately 20 inches mercury of continuous vacuum) would be required. The blower would be installed on a

concrete pad and housed in a utility building to protect the equipment from weather extremes, etc. The blower would be connected to the well collection materials and incorporate one or more flame arresters, since the extracted vapors are potentially explosive. Emissions from the blower would require control by use of carbon absorption.

2.7.3.5 Pit Covers: To prevent rain water from collecting in the pit bottoms and to prevent possible further usage of the pits for liquid disposal, a 6" concrete cover would be constructed over each pit.

2.7.3.6 Closure: As soil vapor and VOCs are removed, the total mass of the residual contamination is gradually reduced. Time required to achieve the remedial goals or action levels varies and is both chemical and soil dependent. For this alternative and site, a time of 4 years was projected. Soil samples will be collected from the affected area after shutdown of the system, and will be analyzed to confirm whether contaminants have been reduced to cleanup levels.

#### 2.7.4 Alternative 8 (Institutional Controls)

Estimated Capital Cost: \$ 15,000  
Estimated Annual O&M Cost: \$ 0  
Estimated Present Worth Cost: \$ 15,000  
Estimated Time to Implement: 2 to 6 months

2.7.4.1 The Institutional Controls alternative involves instituting various access restrictions and institutional controls to prevent current and future human exposure to contaminated media at the site. No measures are taken which address or constitute remediation of the site.

2.7.4.2 Access Restrictions: These generally consist of fencing, warning signs, and sometimes active security measures. Since the DGSC is a secured federal facility, site access is already restricted.

2.7.4.3 Continued Monitoring: Since there is both the possibility that contaminants are still leaching from soils to ground water, and also that some natural attenuation is occurring, continued monitoring of ground water downgradient of the soil source area can provide some level of assurance that further and continued environmental damage is not occurring. The ground-water monitoring at this site will, however, be done as part of Operable Unit OU8 at the DGSC and, therefore, no ground-water monitoring will be required under this Operable Unit 5.

2.7.4.4 Long-Term Institutional Controls: Administrative and legal mechanisms such as deed restrictions and ground-water access prohibitions will be implemented so that the potential future users of the site recognize the risks of the contaminated soil and ground water present there.

#### 2.7.5 Alternative 9 (No Action Alternative)

Estimated Capital Cost: \$0  
Estimated Annual O&M Cost: \$0  
Estimated Present Worth Cost: \$0  
Estimated Time to Implement: NA

2.7.5.1 The No Action alternative, as its name implies, involves absolutely no action at the site. The site is left in its present condition. The risks to human health and the environment remain at the levels established in the baseline risk assessment.

## 2.8 COMPARATIVE ANALYSIS SUMMARY

2.8.0.1 For the comparative analysis presented below, the alternatives from the detailed analysis were evaluated utilizing the EPA's nine evaluation criteria as set forth in the NCP, 40 C.F.R. 300.430(e)(a)(iii) and (f). These nine criteria are as follows:

- . Overall Protection Of Human Health And The Environment Overall  
Protection of Human Health and Environment addresses whether a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment engineering controls or institutional controls.
- . Compliance with Applicable or Relevant and Appropriate Requirements -  
Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes and/or provide grounds for the invocation of a waiver.
- . Long-term Effectiveness and Permanence - Long-term Effectiveness and Permanence refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.
- . Reduction of Toxicity, Mobility, or Volume Through Treatment -  
Reduction of Toxicity, Mobility, or Volume Through Treatment refers to the objective of the treatment technologies that may be employed to remedy site concerns.
- . Short-term Effectiveness - Short-term Effectiveness refers to the speed with which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment as a result of the construction and implementation activities.
- . Implementability - Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.
- . Cost - Cost includes capital and operation and maintenance costs.
- . State/Support Agency Acceptance - State Acceptance indicates whether, based on its review of the RI/FS and Proposed Plan, the State concurs with, opposes, or has no comment on the preferred alternative.
- . Community Acceptance - Community Acceptance will be assessed in the Record of Decision following a review of the public comments received

on the RI/FS report and the Proposed Plan.

#### 2.8.1 Overall Protection

- . Alternative 4 (Excavation and Solid Phase Biotreatment) is effective at protecting human health and the environment as it removes the contaminants of concern, and reduces them to safe byproducts. It also achieves this result relatively quickly.
- . Alternative 7 (Vacuum Extraction) is effective at protecting human health and the environment. Vacuum extraction will remove the contaminants of concern from the soils. Venting of VOCs to the atmosphere is minimized through an emission control system using vapor phase activated carbon. Absorbed VOCs are destroyed when the carbon is regenerated.
- . Alternative 1 (Capping) will not reduce the volume or toxicity of the contaminants, but will reduce their mobility by restricting rainfall and other moisture percolation through the soils.
- . Alternative 8 (Institutional Controls) does not reduce the toxicity, volume, or mobility of the contaminants, although Alternative 8 will restrict access to the contaminants.
- . Alternative 9 (No Action) does not reduce the toxicity, volume, or mobility of the contaminants. It is not protective of the ground water. Therefore, this alternative will no longer be considered.

#### 2.8.2 Compliance with ARARs

2.8.2.1 ARARs and the To Be Considered (TBCs)[1] <Footnote>1 In addition to applicable or relevant and appropriate requirements, the lead and support agencies may, as appropriate, identify other advisories, criteria, or guidance to be considered for a particular release. The "to be considered" (TBC) category consists of advisories, criteria, or guidance that were developed by EPA, or other federal agencies, or states that may be useful in developing CERCLA remedies. 40 C.F.R. §300.400 (g) (3).</footnote> requirements for the ANP site are identified in Table 2-5. Chemical-specific ARARs were not identified for the ANP soils. Risk-based soil action levels for both exposure to workers and protection of ground water were identified as TBCs. The single elevated occurrences of tetrachloroethylene and arsenic were the only significant exceedances of the TBCs. No location specific ARARs or TBCs were identified. Action specific ARARs and TBCs are discussed below.

- . Alternative 4 (Excavation and Solid Phase Biotreatment) satisfies TBCs by destroying organic contaminants present in the soils. This alternative will not satisfy Virginia Solid Waste or Hazardous Waste Management Regulations for replacement of treated soil. Other action-specific ARARs/TBCs can be satisfied. Therefore, this alternative will no longer be considered.
- . Alternative 7 (Vacuum Extraction) satisfies TBCs by physically removing most organic contaminants from the soil. All action-specific

ARARs can be satisfied.

- . Alternative 1 (Capping) does not satisfy the chemicals specific TBCs for soil, since contaminant substances would remain at their current levels. Action-specific ARARs would be satisfied.
- . Alternative 8 (Institutional Controls) provides for institutional monitoring and some exposure control of the site, but otherwise does not seek to limit migration or decrease contaminant volume or toxicity. There are no promulgated ARARs for institutional controls.

#### 2.8.3 Long-Term Effectiveness and Permanence

- . Alternative 7 (Vacuum Extraction) is most effective for VOCs and semi-volatile organics, with the long-term effectiveness for these constituents equivalent to Alternative 4. Non-volatiles would presumably remain, although the increased ventilation of deeper soils has in some similar instances caused an increase in natural biological attenuation of non-volatile organic residuals.
- . Alternative 1 (Capping) is assumed to be effective for as long as the cap material maintains its integrity. However, the complete reduction of migration of all constituents is not assured. Assuming that the capped area is not heavily trafficked, and that periodic maintenance is performed to maintain and repair the cap materials, this type of cap can be expected to last anywhere from 20 to 50 years before requiring a complete reinstallation.
- . Alternative 8 (Institutional Controls) is only effective in preventing surface exposure at the site.

#### 2.8.4 Reduction of Mobility, Toxicity, and Volume

- . Alternative 7 (Vacuum Extraction) reduces mobility, toxicity, and volume of VOCs and semi-volatiles in soil by removing them in the gas phase and using vapor phase activated carbon to minimize the venting of VOCs into the atmosphere.
- . Alternative 1 (Capping) is primarily aimed at reducing the mobility of contaminants and does nothing to decrease their toxicity and/or volume.
- . Alternative 8 (Institutional Controls) seeks to limit exposure at the site. Alternative 8 does not affect contaminant mobility, toxicity, or volume.

#### 2.8.5 Short-term Effectiveness

- . Alternative 8 (Institutional Controls) offers relatively short-term exposure potential since this alternative does not involve disturbance of site materials, and since there was no excess risk from exposure to surface materials as determined in the baseline risk assessment.
- . Alternative 1 (Capping) has a potential for short-term exposure to

contaminated materials since grading of the site prior to installation of the surface cap may be required.

- . Alternative 7 (Vacuum Extraction) likewise involves little site disturbance; only that associated with drilling and well installation. Therefore, a low or moderate exposure potential exists from the movement of contaminated soil in the drilling spoils to the surface.

#### 2.8.6 Implementability

- . Alternatives 8 is the easiest to implement in that no direct physical actions are to take place at the site as part of its implementation.
- . Alternative 7 (Vacuum Extraction) requires a minimum of materials and equipment to install and operate. Drilling beneath the pit bottoms for well installation is the only invasive activity involved. This alternative is relatively easy to implement. Coordination with the Virginia Department of Air Pollution Control will be achieved.
- . Alternative 1 (Capping) is relatively easy to implement, however, the site must be prepared and graded, and the cap must be carefully constructed under stringent quality control guidelines and supervision to maintain that the cap will perform as designed and intended.
- . Alternative 4 (Excavation and Solid Phase Biotreatment) is the most difficult alternative to implement since it involves excavation of contaminated media, treatment on-site, and re-emplacemntof the clean soil. As previously mentioned, this involves the potential for significant human exposure to contaminants for which preventive measures must be undertaken.

#### 2.8.7 Cost

2.8.7.1 The cost comparison among the alternatives is based both on the present worth computed using the initial capital construction costs and annual operation and maintenance costs. The cost comparisons are also based on assumptions about the volume of contamination present. Based on previous discussions, the alternatives are ranked according to cost as follows:

Approach	Present Worth Cost	Ranking
Alternative 8 (Institutional Controls)	\$ 15,000	1
Alternative 1 (Capping)	\$ 43,135	2
Alternative 7 (Vacuum Extraction)	\$115,607	3

#### 2.8.8 State Acceptance

2.8.8.1 The Commonwealth of Virginia, upon review of the Proposed Plan, concurs with the preferred alternative.

#### 2.8.9 Community Acceptance

2.8.9.1 Community acceptance of the preferred alternative was evaluated after the public comment period on the Proposed plan for OU5. The community acceptance is described in the Responsiveness Summary of this ROD.

## 2.9 SELECTED REMEDY

2.9.0.1 Based on the preceding analysis of alternatives, the DLA has determined that Alternative 7 (Vacuum Extraction) is the most effective and appropriate option at the site. The EPA and VDWM concur with this determination. As discussed previously, VOCs were identified as the primary constituents of concern with soils at the ANP site. However, elevated levels of VOCs, particularly tetrachloroethylene (PCE) were detected in only one soil sample directly below the secondary setting pit. These constituents are of primary concern because they were also detected in the ground-water plume apparently originating at this site. Only one bore hole was drilled through each of the two pits. There is, therefore, some degree of uncertainty associated with the concentration and extent of contaminants present in the soil beneath the pits. Ground-water sampling and testing performance in November 1988 indicated that PCE concentration in the plume had increased as compared to those observed in July, 1988. It is possible that soil beneath the pits could exhibit higher concentration of constituents.

2.9.0.2 Vacuum extraction requires the installation of extraction and venting wells, a blower and manifold system, a utility building, and a carbon adsorption system to retain vapors extracted by the system. The soil vapor extractor system shall be operated for a time period sufficient to reduce present concentrations of contaminants of concern in soils to levels below the "Calculated Soil Action Levels" listed in Table 2-4 of this ROD. The estimated time necessary for this system to remove the contaminants from the soils is four years. In addition, two six (6) inch thick by 240 sq. ft. (Pit 2) and 780 (Pit 1) sq. ft. reinforced concrete covers will be constructed over each of the pits to prevent infiltration and unauthorized dumping of waste liquids. Minimal disturbance of soils would take place as the wells would be installed utilizing a small drill rig. Samples shall be collected from the wells to further delineate the amount and extent of subsurface soil contamination. The spent activated carbon from the emissions control system will be handled as hazardous waste from the point of generation until it is regenerated or disposed of at a facility that operates in compliance with the Resource Conservation and Recovery Act (RCRA), Subtitle C.

2.9.0.3 In addition to removing contaminants from the affected soils, this alternative will remove the soils as a possible source for groundwater contamination.

### 2.9.1 Cost Summary

2.9.1.1 A cost summary for this alternative is detailed on Table 2-6.

## 2.10 STATUTORY DETERMINATIONS

2.10.0.1 To meet the statutory requirements of CERCLA Section 121, the

selected remedy must:

- . Be protective of human health and the environment;
- . Comply with ARARs (or justify an ARAR waiver);
- . Be cost effective;
- . Utilize permanent solutions and alternative treatment technologies to the maximum extent practicable; and
- . Satisfy the preference for treatment that reduces toxicity, mobility, or volume as a principal element, or provide an exploration as to why this preference is not satisfied.

2.10.0.2 How the selected remedy complies with each of these requirements is summarized below.

#### 2.10.1 Protective of Human Health and the Environment

2.10.1.1 Alternative 7 (Vacuum Extraction) protects human health and the environment through the treatment of contaminated soils. This remedy will also mitigate the threat of contaminants leaching from the soils into the underlying ground water.

#### 2.10.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

2.10.2.1 The ARAR requirements identified for vacuum extraction at the site include the National Emission Standards for Hazardous Air Pollutants (NESHAPS), State Implementation Plans (SIPs), and Virginia Control and Abatement Air Pollution (VR Rules 4-2, 4-3, 5-3). These requirements will be satisfied.

2.10.2.2 Alternative 7 (Vacuum Extraction) meets chemical-specific TBC requirements at the site by treating contaminants at the site to levels well below the proposed risk-based soil action levels determined for constituents in the soils. The soil action levels are risk-based levels which will protect ground water at the site.

#### 2.10.3 Cost Effectiveness

Alternative 7 (Vacuum Extraction) is the least costly of the alternatives identified that employ treatment as a principal method of remediation. By removing the contaminants of concern from the soils at the site, this option will effectively return the site to its original condition, and is therefore considered the most cost-effective of the alternatives.

#### 2.10.4 Utilization of Permanent Solutions and Alternative Treatment Technologies

2.10.4.1 The DLA has determined that the selected alternative (Vacuum Extraction) represents the maximum extent to which permanent solutions and treatment-technologies can be utilized. The EPA and VDWM have concurred in

the DLA's determination.

2.10.4.2 Of the five balancing criteria, Long Term Effectiveness and Permanence and Reduction of Toxicity, Mobility, and Volume Through Treatment were considered the most decisive factors in the selection of Alternative 7 (Vacuum Extraction). This was because by removing the contaminants of concern, human health and the environment are protected both in the present and the future.

2.10.5 Preference for Treatment which Reduces Toxicity, Mobility, or Volume.

2.10.5.1 This alternative also address the statutory preference of selecting a remedy that utilizes treatment, which reduces toxicity, mobility or volume, as a principal element.

2.10.6 Documentation of Significant Changes

The Proposed Plan for OU5 - Acid Neutralization Pits Source Area was released to the public on January 20th, 1992. The Proposed Plan identified Alternative 7, vapor vacuum extraction as the preferred alternative. DLA reviewed all written and verbal comments submitted during the public comment period. Upon review of these comments, it was determined that no significant changes to the remedy, as it was originally identified in the Proposed Plan, were necessary.

2.10.7 Responsiveness Summary

The purpose of this responsiveness summary is to provide the public with a summary of citizen comments, concerns, and questions relating to two Areas of Concern at the Defense General Supply Center (DGSC) in Chesterfield County, Virginia. The Area of Concern specifically addressed by this responsiveness summary is:

- . Operable Unit Five (OU5) - Acid Neutralization Pits Source Soils

The responsiveness summary details the Defense Logistics Agency's (DLA) responses to these comments, concerns, and questions.

During the public comment period from January 20 through March 6, 1992, both written comments and phone calls were received by DGSC concerning the two operable units. These comments and calls are addressed as part of this responsiveness summary. In addition, a public meeting was held on February 20, 1992 at the Chesterfield Elementary School by the DLA. At this meeting, the Proposed Plans for OU1 and OU5 were presented, and the public was given a opportunity to comment on and ask questions concerning the plans. Several technical questions pertaining to OU1 and OU5 were answered during the public meeting. The responsiveness summary for OU5 is divided into the following sections:

- I. Summary of questions and replies.
- II. Public meeting attendance roster.
- III. Panel of Experts

IV. Selected newspaper notices announcing dates of the public comment period and location and time of public meeting.

All comments and concerns summarized in this document have been considered by the DLA in making a decision regarding the selection of the Vapor Vacuum Extraction Alternative for OU5 - Acid Neutralization Pits Source Soils as the chosen alternative. Those questions that do not pertain to OU5 are preceded by an asterick (\*).

I. Summary of Major Questions and Comments

1. Comment: A resident sent a letter comment to DGSC stating that he agreed with vapor vacuum extraction for the Acid Neutralization Pit soils (OU5) as long as institutional controls were included as part of the final solution.

DLA Response: With the preferred alternative being utilized, the main threat at the ANP area (chlorinated solvents) in the soils are being remediated. The single elevated occurrence of arsenic was encountered at significant depth (15 feet) and is considered unlikely to be encountered by reasonably anticipated site activities. Therefore, the DLA feels that institutional controls will not be necessary if chemical sampling of soils confirms that the chlorinated solvents have been removed after treatment.

\* 2. Comment: A resident sent a letter comment to DGSC requesting that the public comment period for OU1 be started over as one of the referenced documents in the OU1 Proposed Plan was not available in the administrative record. He also questioned whether concerned citizens could get Technical Assistance Grant (TAG) money to help them with the process of understanding the remedial actions taking place at the site.

DLA Response: An additional time period is being allowed for public comment on OU1 as the missing reference document is now present in the administrative record. The EPA is willing to work with any group of citizens that is interested in obtaining TAG money to help their review of past and ongoing remedial activities at DGSC.

\* 3. Comment: A former resident of the area sent a letter comment to DGSC asking that documentation relating to remedial work and laboratory testing of water be sent to her or kept available for viewing. She also requested that documentation as to whether or not her mother's property has contamination present be sent to her as they plan to sell the property.

DLA Response: The former resident was contacted to let her know that all of the administrative record would remain available for review at the Chesterfield Public Library, and that this administrative record contained information on all of the remedial work done at the site. DGSC representatives will also send any information pertaining to water well or other sampling done at her mother's address to help determine whether any contamination is present at the property.

The following comments were received during the public meeting on February 20, 1992.

\* 4. Comment: A resident asked that the public comment period for OU1 be started over as the administrative record was missing a memorandum referenced in the OU1 Proposed Plan.

DLA Response: Refer to Comment #2 response.

5. Comment: A resident stated that he felt that institutional controls should be applied to the ANP area after treatment is complete.

DLA Response: Refer to Comment #1 response.

\* 6. Comment: A resident asked that in the area of ground water contamination whether everyone was hooked up to the county water supply system.

DLA Response: DGSC will look into the situation with anyone who leaves their name and phone number, and the location of the property in question, after the meeting.

\* 7. Comment: A resident asked whether the DLA was aware that not all properties had county water run to them.

DLA Response: Refer to Comment #6 response.

\* 8. Comment: A resident questioned whether anyone present was aware of a site not currently under investigation that the resident had pointed out to a general's aide a number of years earlier.

DLA Response: The DGSC will send out a representative with the resident to investigate the site, and will also forward any testing results concerning the site that they may have to the resident.

\* 9. Comment: A resident questioned why some of the area residents were not on the committee.

DLA Response: The reason that public meeting is being held is to bring all of the concerned residents up to date on clean-up activities for OU1 & OU5.

\* 10. Comment: A resident requested that additional people be put on DGSC's informational mailing list for remedial activities at the site.

DLA Response: Everyone who signed in to the register tonight will be put on the mailing list, unless they request otherwise. Also, residents can contact George Dellinger (DGSC Public Relations Officer) to be put on the mailing list also.

\* 11. Comment: A resident asked for clarification as to who was and who wasn't hooked up to the county water system years earlier.

DLA Response: DGSC will look into the situation and respond to the resident.

\* 12. Comment: A resident that lives along Kingsland Creek asked if the

slime that she had on her well filter was normal.

DLA Response: The DGSC will have someone come to the resident's property to see about testing the water.

13. Comment: A county supervisor asked if material that went into the sanitary sewer at the ANP area eventually went into the county sewer system, and whether downstream hazards had been assessed.

DLA Response: The DGSC will look into what possible impact ANP activities may have had on the county sanitary sewer system.

14. Comment: The county supervisor asked that a reply also be sent to the county administrator.

DLA Response: A response will also be sent to the county administrator.

15. Comment: A resident asked if either OU1 or OU5 drain into Kingsland Creek.

DLA Response: Neither OU1 or OU5 drain into Kingsland Creek.

\* 16. Comment: A resident asked if any other sites drain into Kingsland Creek.

DLA Response: There are other sites that drain into Kingsland Creek, but they are not being addressed tonight, as only OU1 and OU5 are being discussed.

\* 17. Comment: A resident asked when the other sites will be addressed.

DLA Response: Updates as to progress at the other sites will be provided as they become available.

\* 18. Comment: A resident asked how long it would be until results would be available from studies being done on Kingsland Creek. DLA Response: As Kingsland Creek is addressed as part of other operable units not being addressed at this meeting, there are no specific dates that can be given to the resident.

\* 19. Comment: A resident asked whether the DLA had a time frame for reporting on the other sites not being addressed tonight.

DLA Response: Updates as to progress at the other sites will be provided as they become available.

\* 20. Comment: A resident asked whether proposed plans for the other sites would be provided when they are done.

DLA Response: Proposed plans for all of the sites will be made available as soon as they are done.

21. Comment: A resident questioned whether contamination that got into the ground water at DGSC could come out at the surface of a site away from DGSC

if the site was lower in elevation than DGSC, and what the effects of that contamination would be.

DLA Response: During studies at the site, the various ways in which the contaminants could move offsite were investigated. The studies looked at different ways that people away from the site could be affected, including the contaminants being moved in the ground water. The studies showed that if the recommended alternatives are used, human health and the environment would be sufficiently protected from contaminants at the sites.

22. Comment: A resident questioned whether excavation involved with the remediation would cause additional migration of the contaminants.

DLA Response: The DLA has recommended a remediation alternative that does not involve excavation. Rather, at OU5, the contaminants will essentially be "vacuumed" from the soils, and the contaminants will be captured in a carbon adsorption unit.

23. Comment: A resident questioned whether these contaminants would be put in the county sewer line after they are removed from the ground.

DLA Response: The contaminants would not be put in the county sewer line. Instead, the carbon adsorption unit would be sent away for proper disposal.

24. Comment: A resident asked whether the whole process could be started over so that some of the community groups can try for a EPA Tag (money grant).

DLA Response: Refer to Question #2 for the DLA response.

\* 25. Comment: A resident asked how long it would take for a steel drum to rust through if it was buried in the ground.

DLA Response: Although the exact number of years it can take depends on the condition of the drum originally, and the type of soil it is buried in, a buried drum can rust through in approximately a decade.

26. Comment: A resident asked if vacuum extraction would work if there were buried drums.

DLA Response: At OU5, there is no record of buried drums being present, nor were any found during investigative work at OU5.

\* 27. Comment: A resident asked about possible contamination at his property, and whether metals in the ground water could affect his pipes as he is not hooked up to the county system.

DLA Response: As part of the investigative activities at the other sites, which are not being addressed tonight, work is being done to try to determine what types of metals and organics are present in the ground water. The remedies proposed at OU1 and OU5 are designed to be protective of ground water. The remedies for the ground water will deal specifically with contaminants and the problems they may pose in ground water itself. The remedies will also take into consideration the possible affect ground water

contamination could have on residents affected by the situation.

\* 28. Comments: A resident asked whether old wells that had been filled up previously could cause the contaminants to bypass the closed wells and move on to open wells.

DLA Response: Due to the way ground-water flows, the closed wells would not have an effect on the way the contaminants move through the ground water.

## II. PUBLIC MEETING ATTENDANCE ROSTER

## III. PANEL OF EXPERTS

The following list represents the panel members who participated in the public meeting held on February 20, 1992.

Defense General Supply Center  
Colonel John E. Dawley, Jr., U.S. Army  
George Dellinger  
William Saddington  
Art Wells  
Kent Baldwin  
William Walker  
Major Kerry L. Burke, U.S. Army

U.S. Environmental Protection Agency - Region III  
Jack Potosnak  
Hank Sokolowski  
David Sternberg

Virginia Department of Waste Management  
Steve Milhalko  
Jamie Walters

U.S. Army Corps of Engineers  
Roger Fitzpatrick  
Roger Young  
Suzanne Murdock

Law Environmental Inc.  
Thomas Richardson  
Lynden Peters

## IV. SELECTED NEWSPAPER NOTICES ANNOUNCING DATES OF PUBLIC COMMENT AND LOCATION OF PUBLIC MEETING

### PUBLIC NOTICE

Proposed Remedial Action Plans  
for the  
Defense General Supply Center (DGSC) Superfund Site

In accordance with the requirements of the Comprehensive Response, Compensation and Liability Act (CERCLA), the Defense General Supply Center (DGSC), the U.S. Environmental Protection Agency (EPA), and the Virginia

Department of Waste Management (VDWM) invite public comment on the Proposed Plans for two of the eight Superfund operable units: the Open Storage Area (OSA) and the Former Acid Neutralization Pits (ANP). The Superfund public comment period will begin on January 21, 1992 and close on March 2, 1992.

A public meeting will be held to discuss the specifics of the proposed cleanup actions at 7:30 PM on February 20, 1992 at the Bellwood Elementary School, 9536 Dawnshire Road, Chesterfield, Virginia.

A focused feasibility study (FFS) has been prepared by DGSC for the contaminated soils at the OSA. The FFS evaluated the following remedial action alternatives: Alternative 1: Surface Containment/Capping Alternative 2: Solidification/Stabilization Alternative 3: Soil Washing Alternative 4: Evacuation with Off Site Treatment/Disposal Alternative 5: Institutional Controls Alternative 6: No Action

Based on an evaluation of the alternatives, the preferred cleanup option for the OSA is institutional Controls consisting of environmental reviews prior to performing maintenance, an environmental assessment for military construction projects in accordance with the Defense Logistics Agency policy memorandum dated 27 December 1989 and any deed restrictions required under Part 120 (H) of CERCLA.

A focused feasibility study (FFS) has been prepared by DGSC for the contaminated soils at the ANP. The FFS evaluated the following remedial action alternatives: Alternative 1: Surface Containment/Capping Alternative 2: Excavation with Solidification/Stabilization Alternative 3: Excavation with Soil Washing Alternative 4: Excavation with Solid Phase Biotreatment Alternative 5: Excavation with Bulk Incineration Alternative 6: Excavation with Off Site Treatment/Disposal Alternative 7: Vacuum Vapor Extraction Alternative 8: Institutional Controls Alternative 9: No Action

Based on an evaluation of the alternatives, the preferred cleanup option for the ANP is Vacuum Vapor Extraction. Vacuum Vapor Extraction consists of drawing vapors from the soils using extraction wells connected to a manifold system. The system is connected to a blower to draw vapors from the soil. The venting of volatile organic compounds (VOCs) to the atmosphere will be controlled through an emissions control system using vapor phase activated carbon. Citizens can hear presentations on these proposed technologies, and ask questions, at the February 20, 1992 public meeting.

Although these are the preferred remedial options at this time, DGSC, in consultation with EPA and VDWM, may modify the preferred alternative or select another option based on new information presented during the public comment period; therefore the public is encouraged to review and comment on the Proposed Plan for site cleanup prior to the close of the comment period.

Citizens may review and photocopy documents pertaining to the DGSC Superfund site studies and remedy selections in the site Administrative File, located at the Chesterfield Public Library, 9501 Lori Road, Chesterfield, VA 23232. Library hours are 10:00 a.m. to 5:30 p.m., on Wednesday, Friday and Saturday; and 10:00 a.m. to 8:00 p.m. on Monday, Tuesday and Thursday. The library is closed on Sunday.

For more information on the site, the comment period, or the upcoming public meeting or to be added to the mailing list to receive updates on the site, interested citizens may contact:

Mr. George Dellinger  
Defense General Supply Center, DGSC-DB  
Richmond, VA 23297-5000  
(804) 275-3139

DGSC begins clean-up journey

By DAVID BREIDENBACH  
Staff Writer

CHESTERFIELD-Two contaminated sites at the Defense General Supply Center have started a long road to being cleaned up.

About 26 area residents, and officials from the DGSC and the Environmental Protection Agency discussed the sites and clean-up plans at a public hearing Thursday night at Bellwood Elementary School.

The two contaminated sites addressed were an open storage area and an acid neutralization facility. The Virginia Department of Waste Management is also taking part in the cleanup operation.

Marked as a Superfund site, the DGSC cleanup is different than a typical cleanup, said Jack Potasnak of the EPA, which is overseeing the DGSC's cleanup operation, he said.

Usually, sites are abandoned before the EPA ever gets involved. In this case, DGSC is still a working operation.

The entire DGSC site - which has a total of eight contaminated areas - is considered a Superfund site, said David Sternberg, an EPA public affairs specialist. The contamination sites were broken down to smaller areas to make it easier to clean up, he said.

"Of the two tonight, neither are the most severe, but everything is reviewed and the projects should go ahead," he said.

Five of the sites are called source areas, or places where contamination is known to have occurred. The other three involve

See DGSC, page A6

DGSC: Has cleanup hearing

Continued from page A1

groundwater' contamination and are considered the more difficult to clean, he said.

Contamination at the DGSC sites occurred as a result of normal operating procedures at the DGSC over three decades, said George Dellinger, a DGSC

spokesman.

"There were many practices in the '40s, '50s and '60s that were considered normal operating procedures. Nobody thought anything about the environment," he said.

The open storage area, a 43-acre fenced site in the middle of the DGSC is used to store petroleum products. Higher than normal levels of two metals, arsenic and antimony, were found in soil samples there. The contaminated soil is not considered to be a significant risk, said William Saddington of the DGSC.

Because the site poses little risk, Saddington said the preferred method of treatment is to control the area. A fence will be put up around the area and the DGSC will continue to monitor it.

The second site, and acid neutralization facility, poses a different problem, he said. Higher than normal levels of arsenic and an organic contaminant were found.

The arsenic level was no great concern, but the organic contaminant, terchlorethane, which is used in cleaning materials, is of concern, he said. The DGSC intends to vacuum the contaminant out of the ground, he said.

Most of the citizens who spoke at the meeting were concerned with the effects the site has on the groundwater.

In the mid-1980s, water was extended to a number of households in nearby Rayon Park subdivision. About five residents of the subdivision, who are not tied into the county water system, complained of water problems at the meeting.

DGSC representatives took names and addresses and promised to address the questions. A public comment period closes March 6, at which time a final decision will be made on how to clean up each of the two sites, said Sternberg.

It will probably take about four years for the two sites to be cleaned. The groundwater sites are even more difficult to fix, he said.

"The EPA wants this done in a fast and thorough manner. (But) the site is difficult; it is a long-time process," he said.

Federal officials plan cleanup amid ground-water fears

By Mitch Zemel  
Staff writer

Federal officials have presented plans to clean up two of eight Superfund hazardous waste sites at the Defense General Supply Center in Chesterfield County, but surrounding residents are more concerned about groundwater contamination.

Representatives of the military, the U.S. Environmental Protection Agency,

the U.S. Army Corps of Engineers and the state Department of Waste Management conducted a public hearing last night to discuss proposals to handle two of the sites. Both contain soil contaminated with arsenic, and one also contains a hazardous organic compound.

But the approximately 30 residents who attended the hearing at Bellwood Elementary School repeatedly asked questions about two other sites of contaminated ground water.

The officials said studies of those two sites and four others are not complete and they declined to give the residents any information about them. Officials added that they did not know when those sites would be studied or discussed.

Several residents expressed concern that the contaminated groundwater sites had affected their wells. One woman said multiple water filters have failed to make her water drinkable. Another resident said her water pipes corrode rapidly.

After declining to discuss the ground water, the federal officials took the residents' names and addresses and said they would contact them later.

Officials from the Defense General Supply Center have stated that public safety and health are not threatened by the sites, but EPA officials said last night they weren't sure whether residents are being affected by the contaminated ground water.

Most residents in the supply center area were connected to county water lines in the mid-1980s and don't use well water.

EPA officials said the two sites discussed last night are not the most serious ones.

To remove the organic contaminant from the soil at one of the sites, a process called "vacuum vapor extraction" would be used to blow air through the soil. The hazardous compound would be picked up by the air, which then would be filtered to remove the contaminant. The process would take about four years.

To deal with the other site, officials plan simply to restrict access to the area.

The agencies involved will not make a final decision on the cleanup proposals until after the public comment period ends March 6.

EPA officials said there is no timetable for cleanup of the other sites, which were put on the Superfund list in 1987. Most of the contaminants are from petroleum products and were discovered in the early 1980s. Answers on cleanup are few

Bellwood waste sites in question

By Randolph P. Smith  
Staff writer

For 26 years, Jo Ann Cordle has carried water from a well 500 feet from her home because her own well water is "slimy" and "tastes bad."

Even two water filters can't tempt Mrs. Cordle to cook or drink the well water piped into her home.

She wonders if her well is drawing ground water contaminated by chemical leaks at the Defense General Supply Center, which borders her property.

Several of Mrs. Cordle's neighbors in the Bellwood area of Chesterfield County also are worried about contaminated ground water feeding their wells. Some wonder if the cancer death rate in the neighborhood is higher than normal.

But Mrs. Cordle and about 30 neighbors got few answers last night at a public hearing for the first phase of the cleanup of hazardous waste sites at DGSC.

Despite the presence of at least a dozen representatives from DGSC, the state and the Environmental Protection Agency, the most common answer to residents' questions was, "We'll get back to you."

Officials said they weren't prepared to talk about potential ground water contamination.

They generally wanted to restrict the discussion to the first two of eight cleanup projects on the 639-acre military installation, which is one of six major supply depots for U.S. troops around the world.

Both of the initial cleanup efforts focus on contaminated dirt.

One site, a 43-acre storage area where an estimated 80,000 drums now sit, won't even be cleaned up because it "does not present a significant risk," said William Saddington, a DGSC environmental engineer. Soil at the site, which has been a drum storage area since 1942, has been found to contain above-normal levels of two metals.

The second cleanup effort is at the site of two acid neutralization pits.

Chemicals used to clean metal flowed out of a warehouse and into two concrete settling pits, where it was neutralized before being piped into the county sewer system. The pits were used from 1955 to 1985, when they were filled in with clean soil, Saddington said.

Contamination was found in soil under one of the pits and the organic vapors will be vacuumed out of the ground - a process that could take up to four years.

The ground water under the acid pits is contaminated, officials acknowledged, but they didn't want to discuss that in detail last night.

Officials stress that neither the soil nor the ground water poses health threats to DGSC's 3,200 employees or to Bellwood residents.

But several years ago, the federal government paid to extend county water to most of the homes in the Bellwood area after concerns were raised about contaminated ground water flowing off the base.